

## P E T I T I O N

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Your Petitioner, BRADLEY W. KNIPPELMEIR, a citizen of the United States and a resident of the State of Nebraska, whose post office address is 611 East 5th, Fremont, Nebraska 68025, prays that Letters Patent may be granted to him for the improvement in

### A WATER TRAY DRINKER FOR PIGS

as set forth in the following specification.

#### BACKGROUND OF THE INVENTION

##### 1. FIELD OF THE INVENTION

This invention relates to a watering device for animals and more particularly to a water tray drinker for pigs.

##### 2. DESCRIPTION OF THE RELATED ART

The swine industry has traditionally used nipple drinkers for water presentation to the pigs within a confinement pen. The nipple drinkers have been mounted in various ways to make water available to the pigs. The primary ways are: (1) nipple drinkers mounted in the fence-line; (2) swinging nipple drinkers suspended from the ceiling in the middle of a pen; (3) nipples mounted along side tube feeders; and (4) nipples mounted in cups on the fence-line. The above-identified systems rely upon the nipple dispensing the correct water flow rate to satisfy the pigs' needs for all conditions (hot weather, overstocking of pens and bigger pigs with increased water requirements). It is evident based upon the social and vice issues of pigs that those systems do not meet the needs

1 of the pigs in all situations. Flow rates of nipple drinkers are highly dependent upon  
water pressure within the lines, orifice size of the nipples for dispensing water and the  
cleanliness of the screens in the nipples. If any of those elements change, the amount  
of water being made available to the pigs impacts social and performance of the pigs.  
5 The typical pig manager is not capable of determining flow rates at a given point in time.  
Those conditions can be highly variable at any point, thus creating problems with flow  
rates that are not discernable to the manager of the pigs.

#### SUMMARY OF THE INVENTION

10 A water tray drinker for animals such as pigs is disclosed comprising a water tray  
having a bottom wall, upstanding opposite first and second side walls, and upstanding  
opposite third and fourth side walls which define a water compartment for receiving and  
maintaining water therein. A plurality of horizontally spaced-apart and vertically  
disposed divider walls, preferably two, extend upwardly from the bottom wall and extend  
15 between the first and second side walls to separate the water compartment into a  
plurality of water compartment portions. If two divider walls are utilized, first, second  
and third water compartment portions are defined. The divider walls have progressively  
increasing heights from the third side wall toward the fourth side wall whereby the water  
compartment portions may fill progressively from the third side wall to the fourth side  
20 wall. The water compartment portion which is positioned adjacent the third side wall is  
in communication with a selectively adjustable valve water supply which will only fill the  
water compartment adjacent the third side wall unless it is adjusted upwardly to also fill  
the water compartment portion adjacent to the water compartment portion which is  
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1 adjacent to the third side wall. Further upward vertical adjustment of the adjustable  
valve water supply will cause the water compartment portion adjacent the fourth side  
wall to also fill.

5 It is therefore a principal object of the invention to provide an improved watering  
tray for pigs and an associated vacuum valves system which does not rely on constant  
water pressure for a uniform flow rate to dispense water to pigs.

10 A further object of the invention is to provide a water tray for presenting water to  
pigs wherein the reservoir of water within the tray provides the pigs the ability to  
consume water quickly so that they may get in and out of a high activity area of the pen.

Still another object of the invention is to provide a water tray of the type  
described which reduces potential aggression and vice problems associated with  
inadequate water being supplied to the pigs.

15 Still another object of the invention is to provide an invention of the type  
described wherein the producer may readily observe the height of the water in the water  
tray to determine if the system is working correctly.

Still another object of the invention is to provide an invention of the type  
described above wherein water is readily available for presentation to the pigs.

20 Still another object of the invention is to provide watering tray of the type  
described which includes progressively increasing height divider walls which enables  
different amounts of water to be presented to the pigs.

25 Yet another object of the invention is to provide a water tray system of the type  
described above which includes a vacuum water valve which is readily adjustable.

1 A further object of the invention is to provide a watering tray which results in less  
water wastage while making a large amount of water available for individual pigs to  
drink.

5 Still another object of the invention is to provide a water tray drinker for pigs  
which results in fewer social, vice and aggressive behavior problems of the pigs utilizing  
the water tray drinker.

Yet another object of the invention is to provide a water tray drinker for pigs  
including a water reservoir in the tray which permits the pigs to get in and out of the  
water quickly, thereby minimizing the potential for aggressive and vices.

10 Still another object of the invention is to provide a water tray drinker for pigs of  
the type described which enables the producer to easily provide increased water for pig  
intake during peak activity periods resulting in increased feed consumption and better  
growth rates.

15 These and other objects will be apparent to those skilled in the art.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of the water tray drinker for pigs of this invention  
with the water tray being positioned between adjacent confinement pens;

20 Figure 2 is a side elevational view of Figure 1;

Figure 3 is an exploded perspective view of the vacuum valve utilized with the  
invention herein;

Figure 4 is a vertical sectional view of the adjustable valve water supply;

Figure 5 is a view similar to Figure 4 except that the adjustable valve water supply has discontinued the supply of water to the tray; and

Figure 6 is a sectional view of the vacuum valve utilized in this invention.

#### DESCRIPTION OF THE PREFERRED EMBODIMENT

The water tray which is utilized in this invention is referred to generally by the reference numeral 10 and includes a first side wall 12, a second side wall 14, a third side wall 16 and a fourth side wall 18 which extend upwardly from a bottom 20. Preferably, the tray 10 has mounting brackets 22 extending therefrom which enable the tray to be secured to the floor of the pen by means of screws or the like extending through the brackets 22.

The side walls 12, 14, 16 and 18 generally define a water compartment 24. A first divider wall 26 extends upwardly from bottom 20 between walls 12 and 14 and it preferably has a height of 1.5 inches. As seen in the drawings, divider wall 26, side walls 12, 14 and 16 define a first water compartment portion 28. A second divider wall 30 extends upwardly from bottom 20 between side walls 12 and 14 between divider wall 26 and fourth side wall 18, as seen in the drawings, and preferably has a height of 2.0 inches. The height of walls 12, 14, 16 and 18 is somewhat greater than the height of divider wall 30, as seen in Figure 2. Divider walls 26 and 30 define a water compartment portion 32 while divider wall 30 and fourth side wall 18 define a water compartment portion 34 therebetween. Although the drawings illustrate a pair of spaced-apart divider walls, any number of divider walls could be utilized although two divider walls are preferred.

1 The water tray 10 is positioned on the floor of the confinement area so that it is  
positioned beneath the pen divider 36 with the side walls 16 and 18 and the divider  
walls 26 and 30 being disposed transversely to the pen divider 36. Thus, approximately  
one-half of the water compartment portions 28, 32 and 34 are accessible by the pigs on  
5 either side of the pen divider 36.

The means for supplying water to the tray 10 is generally referred to by the  
reference numeral 38. Means 38 includes a vertically disposed pipe 40 having a lower  
end 42 and an upper end 44. Pipe 40 is selectively vertically adjustably secured to the  
pen divider wall 36 by U-clamps 45 or the like. The numeral 46 refers to a vertically  
10 disposed pipe which is selectively adjustable positioned within pipe 40 and which has  
an upper end 48 and a lower end 50. The lower end 50 of pipe 46 is positioned above  
water compartment portion 28, as illustrated in the drawings. The pipe 46 is selectively  
vertically adjustably mounted with respect to the pipe 40 by means of a set screw 52  
15 which threadably extends through pipe 40 for engagement with the pipe 46 to maintain  
the pipe 46 in selective vertical positions with respect to pipe 40.

A conventional vacuum water valve 54, such as manufactured by Rotecna S.A.,  
Polígono Industrial. Nave n.3, 25310 Agramunt (Lleida) Spain, is mounted to the upper  
end of pipe 46, as illustrated in the drawings. Valve 54 includes casing members 56  
20 and 58 which are secured together at their peripheries by means of bolts 60. A  
diaphragm 62 is secured to the peripheries of casing members 56 and 58 to define  
compartment portions 64 and 66 within valve 54. A water inlet port 68 extends inwardly  
through casing member 58 so that the inner end thereof is in communication with  
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1 compartment portion 66 (Figure 6). Port 68 is in fluid communication with the interior of  
water pipe or tube 69 which is in fluid communication with a source of water so that  
water is supplied to compartment portion 66. Diaphragm 62 is adapted to seal the inner  
end of port 68 to prevent water from entering the interior of compartment portion 66.  
5 Valve 54 includes a conventional water shut-off mechanism 67.

A flexible plastic tube 70 is provided in the water vacuum valve 54, as illustrated  
in Figure 3, and has its lower end 72 positioned approximately nine inches above the  
lower end 50 of pipe 46, as seen in the drawings. The lower end 50 of pipe 46 is initially  
positioned slightly below the upper end of divider wall 26. In normal operation, water is  
10 supplied to port 68 and flows downwardly between tube 70 and the interior of pipe 46  
(Figure 4) and continues to flow until water in compartment portion 28 reaches the lower  
end 50 of pipe 46. When the water in water compartment portion 28 reaches the lower  
end 50 of pipe 46, the vacuum within compartment 66 in the valve 54 causes the  
15 diaphragm 62 to seal upon the inner end of the inlet port 68 thereby preventing further  
water from flowing into compartment portion 28. As the pigs consume water from the  
water compartment portion 28, the water level in compartment portion 28 will drop  
below the lower end 50 of pipe 46 which will cause the diaphragm 62 to unseat from the  
inner end of the inlet port 68 so that additional water will be supplied to compartment  
20 portion 28 until the water level in water compartment portion 28 reaches the lower end  
50 of pipe 46 which will again cause the diaphragm 62 to seal or close the inner end of  
water inlet port 68.

1 If additional water is desired to be furnished to the pigs, the set screw 52 is  
loosened and the pipe 46 is raised with respect to the pipe 40 so that the lower end 50  
of pipe 46 is positioned above the upper end of divider wall 26 but is positioned below  
the upper end of divider wall 30. Water flowing from the lower end of pipe 46 will fill  
5 compartment portion 28 with the overflow therefrom flowing into water compartment  
portion 32 until the water level within the tray 10 reaches the lower end 50 of the pipe 46  
which will again cause the inner end of the inlet port 68 to be sealed by the diaphragm  
so that additional water is not supplied to the water tray.

10 If even additional water is desired to be supplied to the water tray 10, the pipe 46  
is further raised with respect to pipe 40 so that the lower end 50 of pipe 46 is positioned  
above the upper end of divider wall 30 but is positioned below the upper end of the side  
walls 12, 14, 16 and 18 so that water compartment portion 34 will also be filled.

15 It can therefore be seen that the invention accomplishes at least all of its stated  
objectives.